

CLAIMS

1) A method for treating a natural gas containing hydrocarbons, hydrogen sulfide and water, wherein the following stages are carried out :

a) cooling the natural gas so as to condense water and to recover a gaseous effluent,

5 b) distilling the gaseous effluent obtained in stage a) so as to obtain a liquid phase and a gas phase, and cooling said gas phase so as to obtain a condensate and a gaseous effluent depleted in hydrogen sulfide and in water, and

c) contacting at least part of the gaseous effluent obtained in stage b) with a first physical solvent so as to obtain a liquid effluent and a treated gas depleted in hydrogen
10 sulfide.

2) A method as claimed in claim 1, wherein the gaseous effluent obtained in stage b) is maintained at a temperature ranging from -100°C to 30°C and at a pressure above 1 MPa abs.

3) A method as claimed in claim 1, wherein the first physical solvent is an aqueous
15 solvent having a water content below 50 % by weight.

4) A method as claimed in claim 1, comprising the following stages :

d) expanding the liquid effluent obtained in stage c) so as to obtain a hydrocarbon-depleted liquid effluent and a gaseous effluent containing hydrocarbons, and

e) contacting the gaseous effluent obtained in stage d) with a second physical
20 solvent so as to obtain a liquid effluent containing hydrogen sulfide and a fuel containing hydrocarbons.

5) A method as claimed in claim 1, comprising the following stage :

f) distilling in a distillation column at least one of the liquid effluents obtained in stages c), d) and e) so as to obtain a regenerated solvent at the bottom of said column.

6) A method as claimed in claim 5, wherein the following stage is carried out
5 before stage f) :

g) heating at least one of the liquid effluents obtained in stages c), d) and e) so as to obtain a mixed effluent containing a liquid phase and a gas phase.

7) A method as claimed in claim 6, wherein the gas phase obtained in stage g) is fed
into the top of the distillation column of stage f) separately from the liquid phase
10 obtained in stage g).